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# Paper

*by* Christina 10

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## STRESS IN PATIENTS WITH DIABETES MELLITUS

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### Abstract

Stress is a <sup>2</sup>trigger increased blood glucose levels that sought to reduce, by knowing the causes of stress. The objective of this study was to identify stress levels in patients with diabetes mellitus. This study used descriptive research design with the variable was stress level. Samples were taken using simple random sampling, with 34 patients with Diabetes mellitus in Dr. Ramelan Navy Hospital, Surabaya. Data collection was undertaken using questionnaire (*Problem Areas in Diabetes*), glucometers and observation sheet (blood glucose and diabetic foot ulcers). Data were then analyzed descriptively. The results showed that most of the respondents had diabetes-related distress, as many as 25 patients (73,5%) (mean± SD 50,15 + 13,057). Most respondents experience distress caused by worrying about the threat of more severe disease (hyperglycemia and diabetic foot ulcers) and negative perceptions such as feeling depressed and desperate when thinking about illness and treatment (diet and medication). Positive perceptions are needed to improve motivation in performing the treatment.

**Keywords :** Stress level, blood glucose level, diabetic foot ulcer, Diabetes mellitus

### INTRODUCTION

People with Diabetes not only suffer from having to continue taking their blood, insulin injection, or taking medication, but will also experience emotional distress, anger, fear, resentment, or disappointment, all of which trigger stress. Stress will make blood glucose rise and diabetes control becomes worse (Tandra, 2010).

Diabetes Treatment In Diabet Room Dr. Rumkital Navy hospital, Surabaya, the patient should be injected 1-3 times per day, diet foods that should be regulated, there is a diabetic foot wounds and complications of the disease, impaired self-concept, difficulty adapting and hospitalization problems. This can lead to changes in the life of the patient who became one of the triggers of stress. It can be seen from the attitude and behavior in complying with the regimen of treatment

and care that has been determined. This stress condition will make blood glucose rise and control of Diabetes becomes worse. Diabetes mellitus is now suffered by more than 230 million people worldwide, and the number of patients is estimated to increase to 350 million by 2025. Each year, there are 6 million new Diabetes sufferers in the world. 50% of deaths are caused by coronary heart disease, and 30% are due to kidney failure. In addition to death, Diabetes also causes disability. Approximately 30% of diabetics suffer from blindness due to complications of retinopathy and 10% have to undergo amputation of the legs. In Indonesia, the World Health Organization (WHO) estimates an increase in the number of people with DM in Indonesia, from 8.4 million in 2000 to 21.3 million in 2030. Bad lifestyle is one cause of high numbers

of people with diabetes in the country (Nurjanah and Juliyanti, 2007). Stress triggers stress hormones such as cortisol, adrenaline, or growth hormones, which are all against insulin, so blood glucose will rise (Tandra, 2010). This statement is also in accordance with Campbell (2013) which suggests that stress may predict the rate of diabetes-related chronic blood glucose control, and a high distress in a person most associated with the disease. Ongoing stress causes the activity of the HPA axis are increased so that cortisol levels increase, accompanied by an increase in glucose in circulation, on the other hand cortisol also affect the function of insulin-related in terms of sensitivity, production, and receptors that blood glucose can not be balanced (Avgerinos, et al, 1992 in Putra, 2011: 39). Hypoglycemia, trauma, illness, fever, psychological stress and physical activity will all be triggers the hypothalamus to secrete corticotropin release hormone (CRH; corticotropin-releasing hormone), where this hormone stimulates the cells kortikotrof anterior pituitary to release ACTH. ACTH stimulates the adrenal cortex to synthesize cortisol. Excessive cortisol will increase the effect of maintaining blood glucose by increasing gluconeogenesis, decrease glucose uptake by cells and increasing lipolysis and protein catabolism (Tao and Kendall, 2013). Campbell (2013) explains that if patients experience stress will reduce the ability to care for themselves. This means that distress / stress conditions are not only related to biological stress response but to behavior in glycemic control (physical exercise, diet, and medication adherence). In a state of chronic hyperglycemia will have the potential for the occurrence of basic changes in the formation of chronic complications of diabetes (Putra, 2011; Luthra, 2010). The role of nurses in stress management Diabetes patients need to first identify the factors that affect stress, nurses can explore the thoughts and feelings of patients so that the data obtained correctly

related to stress experienced so that stress can be managed properly and blood glucose control can be balanced.

#### 4 MATERIALS AND METHODS

This study used descriptive research design with the variable was stress level. Samples were selected by simple random sampling, as many as 34 patient with Diabetes Mellitus in Dr. Ramelan Navy Hospital, Surabaya, with inclusion criteria were type 1 and 2 Diabetes Mellitus, aged 30-75 years old. Data collection was undertaken using questionnaire containing demographic data of patients, glucometer, alcohol swabs and observation sheet to measure fasting blood glucoses, diabetic foot observation sheet according to Wagner (cited by Misnadiarly, 2006) consists of five grade diabetic foot ulcers. Measurement of stress levels using questionnaires were adapted from The Problem Areas in Diabetes Survey (PAID) (Polonsky et al, 1995, cited by Veves, Giurini & LoGerfo, 2006) with 5-points Likert scale of answers. Skor  $\geq 40$  = Diabetes-related distres and Skor  $\leq 40$  = Low Diabetes-related distres. Data were then analyzed descriptively.

#### RESULTS AND DISCUSSION

Overall, of the 34 respondents in Dr. Ramelan Navy Hospital, Surabaya, Diabetes mellitus patients were characterized with average aged 45-64 years old (58,8%), the number of men and women is the same, and had last education in senior high school (64,7%). All respondents have been married (100%), average income of 1-2 million, pensioner (38,2%) and entrepreneur (26,5%). Most respondents suffered from Diabetes Mellitus for 1-10 years (79,4%) and average respondent was hospitalized once (48,8%). Characteristics of respondents can be seen in table 1. The results showed that most of the respondents had diabetes-related distress, as many as 25 patients



(73,5%) (mean± SD 50,15 + 13,057). can be seen in table 2.  
 Respondents Stress levels characteristic

Table 1 : Respondents' characteristic in Dr. Ramelan Navy Hospital, Surabaya, in May-August 2013 (n = 34)

No	Characteristic	Frequency (n)	Percentage	
1	Age	<45 years old	6	17,6%
		45-54 years old	10	29,4%
		55-64 years old	10	29,4%
		65-75 years old	6	17,6%
		≥75 years old	2	5,9%
2	Gender	Man	17	50,0%
		Woman	17	50,0%
3	Last education	Never attending school	0	0,0%
		Primary School	1	2,9%
		Junior High School	9	26,5%
		Senior High School	22	64,7%
		College	2	5,9%
4	Marital status	Married	34	100,0%
		Single	0	0,0%
		Widow/widower	0	0,0%
5	Income (IDR)	< 500.000	2	5,9%
		500.000 - 1 million	2	5,9%
		1 - 2 million	19	55,9%
		> 2 million	11	32,4%
6	Occupation	Pensioner	13	38,2%
		Entrepreneur	9	26,5%
		Government employees	1	2,9%
		Member of National Army	6	17,6%
		Private employee	1	2,9%
		Unemployed	4	11,8%
7	Duration of Diabetes	1-10 years	27	79,4%
		11-20 years	6	17,6%
		21-30 years	1	2,9%
8	Hospital admission experience due to Diabetes	Never	6	17,6%
		Once	20	58,8%
		Twice	6	17,6%
		Three times	2	5,9%

Source : Primary data

Table 2 : Respondents Stress levels characteristic

Stress levels	Frequency	Percentage (%)
Low Diabetes-related Distress	9	26,5%
Diabetes-related Distress	25	73,5%
Total	34	100%
Mean + SD	50,15 + 13,057	
Min-max	24-80	

Source : Primary Data

## DISCUSSION

Diabetes mellitus is a metabolic disorder characterized by hyperglycemia (elevated serum glucose levels) due to lack of insulin hormone, decreased insulin or both effects (Kowalak, Welsh, Mayer, ed., 2011). Patients Diabetes hospitalized, with various signs and symptoms experienced such as polyuria, polydipsia, anorexia or polyphagia, weight loss, infections / wounds in the legs are slow heal (gangrene), and others, including the problem of injection treatment Insulin for a long time, blood glucose examinations and treatments such as leg exercises and diit Diabetes settings to be a stressor that if not addressed will affect the health status of patients. It is proved that most of Diabetes Mellitus patients in Dr. Ramelan navy hospital, Surabaya, had diabetes-related distress, 25 respondents (73.5%), and those who experienced low diabetes-related distress were 9 respondents (26.5%).

Stress will make blood glucose levels rise and Diabetes control becomes worse. Stress triggers stress hormones such as cortisol, adrenaline, or growth hormone, all of which can fight insulin, so that blood glucose will rise (Tandra, 2010). This statement also complies with Campbell (2013) who suggests that diabetes-related stress can predict chronic blood glucose control levels, and high distress in a person is mostly associated with the disease.

Most respondents experience distress, it can be explained that Diabetes is a disease that can not be cured and requires strict treatment. The amount of stressors that must be faced requires Diabetes sufferers to adapt, according to Weiten's (2007) statement cited by Putra (2011) that any stressors received by individuals will be thoroughly studied resulting in correct perception that will eventually be responded correctly. Helplessness and lack of self-acceptance are psychological factors that can lead patients to stress, anxiety and even depression (Stuart and Sundeen, 1998). Stress is the inability to cope with the threats faced by the mental,

physical, emotional and spiritual human beings that may at some point affect human physical health (National Safety Council, 2003). Stress will make blood glucose levels rise and Diabetes control becomes worse.

One of the factors that influence the occurrence of distress in Diabetes patients is the threat of more severe disease that is hyperglycemia and diabetic foot ulcers (Suliswati, 2005; Lidya, 2013; Pramudiarja, 2010), it is proven that from 25 respondents who experienced Diabetes-related distress, As many as 17 respondents (68%) had blood glucose levels 100-199 mg / dL and 5 respondents (20%) blood glucose > 200 mg / dL. Researchers assume Diabetes patients will tend to ask about the results of measurements of blood glucose levels, expecting blood glucose levels are at normal levels, feelings of anxiety to know blood glucose levels especially patients with high blood glucose levels will increase the negative perception of patients who impact on the condition of distress . The presence of hyperglycemia in people with diabetes can occur complications at all cell levels and all levels of anatomic. Manifestations of chronic complications can occur at the level of small blood vessels (microvascular) in the form of abnormalities in the retina of the eye, glomerulus kidney, nerves and the heart muscle. Diabetes mellitus can cause problems for a person both physical and psychological problems, problems arising from diabetes mellitus such as problems related to physical and metabolic changes (Suliswati, 2005; Lidya, 2013; Pramudiarja, 2010).

The threat of a more severe disease is the incidence of diabetic foot injuries, but diabetics also take longer to heal wounds in the legs. These results are supported by Widodo's (2008) statement that stress can arise because of the patient's negative perception of high blood glucose levels, physical complaints, pre-ill dict and long-standing DM, besides diabetic patients take longer to heal wounds in the legs . The



study showed that there were 15 respondents (60%) with diabetic foot ulcer grade 0, based on interview results, the respondents expressed fear of more severe complications and amputations. This statement was also proved based on questions in the questionnaire *The Problem Areas in Diabetes Survey (PAID)*, the highest score (147) at number 3, where respondents mostly feel worried about the future and the possibility of serious complications to be faced. Similarly, the second highest score (138) in the questionnaire PAID number 20 where as many as 82.4% of respondents feel bored must constantly trying to manage Diabetes. This negative perception becomes a stressor that actually worsens the situation, in a state of stress catecholamines stimulate suprarenalis to secrete cortisol which can affect the associated insulin function in terms of sensitivity, production and receptor, so that blood glucose is difficult to balance (Avgerinos, et al, 1992, cited by Putra 2011), in addition increased cortisol levels cause wound healing process in the leg lasts longer.

Gunarsa & Gunarsa (2012) argue that the cause of psychological disorders not only comes from family and social interaction but many factors such as the inability to satisfy basic desires, extreme fatigue, boredom, periods of great physiological changes, pressures from economic circumstances, Disease, trauma, inflammation, poisoning and emotional shock. According to researchers there are several other factors that cause a person experiencing stress. Body and soul is an aspect whose function in all organisms can not be separated, the disease can be influenced by psychological factors, and vice versa disease can influence the clear psychological attitude of a person. People suffering from severe illness will form a stress, anxiety and pessimism. In this case, patients with diabetes mellitus suffer from severe disease will worry about complications or loss of parts of the body due to amputation can cause severe stress.

Tao and Kendall (2013) explains that hypoglycemia, trauma, illness, fever, psychological stress and physical activity will all be triggers the hypothalamus to secrete hormones release of corticotropin (CRH; corticotropin-releasing hormone), where this hormone stimulates the cells kortikotrof anterior pituitary To release ACTH. ACTH stimulates the adrenal cortex to synthesize cortisol. Excessive cortisol will increase the effect of maintaining blood glucose by increasing gluconeogenesis, decreasing glucose uptake by cells and increasing lipolysis and protein catabolism. Researchers assume that the threat of more severe illness and stress levels have a reciprocal relationship, feelings and negative perceptions of the threat of living will increase stress hormones that would lead to an increase in blood glucose levels, vasoconstriction of blood vessels which will cause the length of wound healing.

Meanwhile, from 9 respondents who experienced low diabetes-related distress, as many as six respondents (66.7%) had a grade diabetic foot ulcers 0. This is consistent with the statement Selye (1936, cited by Putra, 2011) that stress is a condition caused by a Stimulus, this stimulus is essentially a stressor. Researchers argue that the absence of diabetic foot injuries does not necessarily make Diabetes patients free from distress conditions, there are many conditions that become stressors for diabetic patients, but the results found lower levels of distress in respondents with classic diabetic foot classification wounds. Found 1 respondent (11.1%) patients with grade 5 diabetic foot ulcers but had low diabetes-related distress. It can be explained that many other factors that can cause these respondents do not have diabetes distress or are able to adapt well to the stress experienced. Gunarsa and Gunarsa (2012) suggested that factors that can affect the adjustment are psychological factors, learning experiences, conditions, frustration and conflict, self-determination.

Based on the results of questionnaires respondents have been suffering from diabetes mellitus for 30 years so that respondents have experience learning long enough to provide the right coping of stress experienced so that respondents are in adaptive conditions.

Suliswati (2005) and Putra (2011) explained that stressors can be classified into internal biological stressors, ie from pathological events in the body itself, or external from outside the body, such as physical, chemical, and non-stimulus biological. Similarly, described by Gunarsa and Gunarsa (2012) that the disease can affect a person's psychological attitude clearly. People with severe illness will form anxiety and pessimism that is immediately transferred elsewhere and coloring interpersonal relationships and adjustments. The ability of Diabetes patients to adapt and adapt to sickness conditions is strongly influenced by the environment, in this case is support that is a beneficial condition for individuals obtained from others who can be trusted, so that one will know that there are others who pay attention, respect and Love him. It is proven as much as 64,7% of respondents feel not alone suffering from diabetes, and as many as 85,3% respondents feel friends and family very support healing of patient.

The Problem Areas in Diabetes Survey (PAID) questionnaire also assessed the problem areas of Diabetes patients related to their care. This study found 67.6% of respondents on average feel satisfied with doctors who treat it, as well as regulation diet, as many as 76.5% of respondents feel continue to worry about the pattern of food, 64.7% of respondents rate no matter if prohibited in terms of food , Of course very appropriate because as much as 97.1% of the total respondents were worried about the future and serious complications to be faced. The study also found as many as 73.5% of respondents felt guilty when violating the rules of diabetes care. In line with Soewondo's (2015) statement that good glycemic

control is associated with reduced diabetes complications. Researchers assume this is certainly very good if Diabetes patients really realize that setting diet is one of the handling of Diabetes so that glycemic control can be optimal and complications can be prevented, otherwise poor blood glucose control will lead to various complications that include Diabetic Ketoacidosis (KAD) Non-ketotic hyperosmoler (HONK), heart disease, stroke, nerve, eye and kidney damage, diabetic injuries and others all bring the patient in very bad condition even to death. Dhabhar & Mc Ewen, 1997 (in Asiyah, 2010) states that stress is a collection of several events, consisting of stimuli (stressors) that give immediate reaction to the brain (stress perception) and physiological activity (stress response). Stress response is often seen to have an adaptive effect, when stress occurs acutely and causes a harmful effect when stress occurs chronically. This concept is hereinafter referred to as stress perception and stress response. These two forms of stress describe the response to stimuli and stressors. Perception stress is the first step in interpreting the source of stress or stressor received by sensory organs and determine the accuracy of stress response to the stressor. All sensations received by the sensory organs will be perceived by the individual. Furthermore, individuals will respond to the stressor until it can achieve a new equilibrium (eustress) or cause disturbance of balance (distress) (Putra, 2005 in Asiyah, 2010: 13). Adaptation is an individual effort to overcome the unpleasant circumstances, such as conflict, tension, frustration, or stress on the individual. The aspects of adjustment, is a function of the social, moral, and physical health (Lazarus & Folkman in Santrock, 2004, cited by Yuliastuti and Nurhidayati, 2016). The response to the stressor is influenced by the perception of the patient's diabetes. The results showed as many as 73.5% of respondents felt discouraged by the treatment plan and



feared thinking about Diabetes sickness suffered. In addition, 41.2% of respondents did not receive diabetes. Researchers believe that the negative perception of respondents is what causes the patient's response maladaptif to pain so that fall in the condition of distress.

#### CONCLUSION

Most of the respondents had diabetes-related distress, caused by worrying about the threat of more severe disease (hyperglycemia and diabetic foot ulcers) and negative perceptions such as feeling depressed and desperate. Treatment of Diabetes requires very strict adherence so a positive perception is needed to improve motivation in performing the treatment

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